## Remarks

Applicants respectfully request reconsideration of the present application in view of the above amendments and following remarks. Claims 1, 6 and 9-12 have been amended and claims 13-18 have been added. Claims 4, 5, 7 and 8 have been cancelled. Therefore, claims 1-3, 6 and 9-18 are pending in the present application.

Claims 1, 2, 4, 6, 7, 9, 11 and 12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese Reference No. JP2001-41012 to Ichinose ("the Ichinose reference"). Claims 4 and 7 have been cancelled, therefore the rejection of these claims is moot. Applicants respectfully traverse the remaining rejections.

Amended claim 1 is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser having a rear cover plate and a front cover plate secured to the stator and enclosing the rotor within the stator. The phaser includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism includes a locking pin, a well, means for directing phase-advance oil to the pin for urging the pin from the well, and means for directing phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-advance oil includes a first channel connecting the well to a supply of the phase-advance oil. Further, the means for directing the phase-retard oil includes a second channel connecting the well to a supply of the phase-retard oil.

The Ichinose reference does not teach or suggest a locking pin mechanism having a well formed in the front cover plate for receiving a portion of the locking pin in a locking mode as recited in claim 1. As best seen in FIGS. 3, 5A and 6 of the Ichinose reference, a well (231) is formed in the rear cover (13) and is adapted to receive the locking pin (230). Nothing in the Ichinose reference appears to disclose a well formed in the front cover (102) for receiving the locking pin (230) as required in claim 1.

In rejecting the claims, the Examiner stated that it would have been obvious to reverse the position of the well (231) to the front cover plate (102) depending on the engine, "since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art." *Office Action*, pgs. 5-6. Applicants submit that the Examiner has failed to establish a prima facie case of obviousness based upon the Ichinose reference.

"Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ.2d 1313, 1316-17 (Fed. Cir. 2000). In addition, a rejection based upon 35 U.S.C. § 103(a) must rest on a factual basis. *See In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968). The Examiner has the initial burden of supplying the factual basis for its rejection and may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis. *See Warner*, 379 F.2d at 1017, 154 USPQ at 178. "The mere fact that the prior art could be so

modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Mills*, 916 F.2d 680, 682, 16 USPQ.2d 1430, 1432 (Fed. Cir. 1990) *quoting In re Gordon* 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

The Examiner provided no factual evidence that the Ichinose reference suggests placing the well (231) in the front cover plate (102) instead of the rear cover plate (13). The Examiner merely stated that reversing essential working parts of a device involves only routine skill in the art . *See Office Action*, pgs. 5-6. However, the modification suggested by the Examiner does not merely reverse the working pieces of the phaser, it requires that the front cover plate (102) be reconstructed to allow the locking pin (230) to engage the front cover plate (102). *See In re Ratti*, 270 F.2d 810 (CCPA 1959) (stating that an obviousness rejection is inappropriate if substantial reconstruction or redesign of the prior art references is necessary to arrive at the invention). Given the insufficient factual basis presented by the Examiner, it is not apparent why one of ordinary skill in the art would have been motivated to form the well in the front cover plate (102) in view of the teachings in the Ichinose reference.

As set forth in the present patent application, the well is defined in the front cover of the phaser so that the locking pin and accompanying components may be assembled into the rotor after the rotor is installed into the stator. *See Specification*, pg. 3, lines 13-15. Further, the position of the well in the present invention allows for the sprocket to be formed integrally with the stator rather than the rear cover thereby enhancing manufacturability and reducing cost. *See Specification*, pg. 6, lines 21-

23. By forming the well in the rear cover (13) as in the Ichinose reference, it is difficult to reliably assemble the phaser and therefore highlights the problems the present invention intends to solve. *See Specification*, pg. 2, lines 19-22.

Since the Examiner has failed to show that the Ichinose reference teaches or suggests all of the limitations included in claim 1, Applicants request that the rejection of claim 1 be withdrawn. As claims 2, 6, 9 and 10 depend from claim 1, these claims are also not taught or suggested by the Ichinose reference of record for at least the same reasons set forth with respect to claim 1.

Dependant claims 6 and 9 are further distinguishable over the Ichinose reference. Claim 6 states that the first channel is formed in one of the front cover plate and the rotor. Even if the Ichinose reference was modified so that the well (231) and advance channel (121) were formed in the front cover plate (102), which Applicants believe to be incorrect, the phase-advance oil channels (233, 233a, 237) would not be formed in one of the front cover plate (102) and the rotor. Instead, channels (233, 233a, 237) would be formed in both the front cover plate (102) and the rotor as best seen in FIG. 6 of the Ichinose reference.

Claim 9 states that the second channel is formed in one of the front cover plate and the rotor. Even if the Ichinose reference was modified so that the well (231) and advance channel (121) were formed in the front cover plate (102), which Applicants believe to be incorrect, the phase-retard oil channels (235, 235a, 239) would not be formed in one of the front cover plate (102) and the rotor. Instead, channels (235, 235a, 239) would be formed in both the front cover plate (102) and the rotor as best seen in FIG. 6 of the Ichinose reference.

Amended claim 11 is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser having a rear cover plate and a front cover plate secured to the stator and enclosing the rotor within the stator. The phaser includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism includes a locking pin, a well, and means for directing at least one of the phase-advance oil and the phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-retard oil includes a channel connecting the well to a supply of the phase-retard oil.

For at least the same reasons set forth with respect to claim 1, the Ichinose reference does not teach or suggest all of the limitations included in amended claim 11. In particular, the Ichinose reference does not teach or suggest a locking pin mechanism including a well formed in the front cover plate for receiving a portion of the locking pin in a locking mode as recited in claim 11. As such, Applicants request that the rejection of claim 11 be withdrawn.

Amended claim 12 is directed to an internal combustion engine including a vane-type camshaft phaser comprising a locking pin mechanism for variably locking together a rotor and a stator. The phaser has a rear cover plate and a front cover plate secured to the stator for enclosing the rotor within the stator. The phaser also includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and the stator. The locking

pin mechanism includes a locking pin, a well, means for directing the phase-advance oil to the pin for urging the pin from the well, and means for directing the phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-advance oil includes a first channel connecting the well to a supply of the phase-advance oil. The means for directing the phase-retard oil includes a second channel connecting the well to a supply of the phase-retard oil.

For at least the same reasons set forth with respect to claim 1, the Ichinose reference does not teach or suggest all of the limitations included in amended claim 12. In particular, the Ichinose reference does not teach or suggest a locking pin mechanism including a well formed in the front cover plate for receiving a portion of the locking pin in a locking mode as recited in claim 12. As such, Applicants request that the rejection of claim 12 be withdrawn.

Claims 1-4, 6, 9, 11 and 12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,960,757 to Ushida ("the Ushida reference"). Claim 4 has been cancelled, therefore the rejection to this claim is moot. Applicants respectfully traverse the rejection of the remaining claims.

The Ushida reference does not teach or suggest a locking pin having means for directing phase-retard oil including a channel connecting the well to a supply of phase-retard oil as recited in claims 1, 11 and 12. Instead, the Ushida reference includes a channel (29, 31, 33) that extends between the phase-retard chambers (10, 11) and a hydraulic chamber (23) positioned adjacent to an upper portion of the

piston (7). *See Ushida*, Col. 10, lines 30-32; Col. 12, lines 15-22; FIGS. 1, 2, 5. The channel (29, 31, 33) does not connect the supply of phase-retard oil to the hydraulic chamber (24). *See Ushida*, Col. 10, lines 32-34. Thus, the Ushida reference fails to teach or suggest all the limitations included in claims 1, 11 and 12. As claims 2, 3, 6 and 9 depend from claim 1, these claims are also not taught or suggested by the Ushida reference for at least the same reasons set forth with respect to claim 1. Applicants request that the rejection of these claims be withdrawn.

Claims 5, 8 and 10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ichinose reference. Claims 5 and 8 have been cancelled, therefore the rejection of these claims is moot.

Amended claim 10 depends from claim 1 and states that the cross-sectional area of the second channel is smaller than the cross-sectional area of the first channel. As stated above, the Ichinose reference does not teach or suggest a locking pin mechanism having a well formed in the front cover plate for receiving a portion of the locking pin in a locking mode as recited in claim 1. Since claim 10 includes all the limitations in claim 1, claim 10 is not taught or suggested by the Ichinose reference for at least the same reasons set forth with respect to claim 1. Applicants request that the rejection of claim 10 be withdrawn.

Claims 5 and 8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ushida reference. Claims 5 and 8 have been cancelled, therefore the rejection of these claims is moot.

New claims 13-15 depend from claims 1, 11 and 12, respectively, and each state that the locking pin is a straight-sided pin. None of the references of record teach or suggest the feature set forth in claims 13-15.

New claim 16 is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser. The vane-type camshaft phaser has a rear cover plate and a front cover plate secured to the stator and encloses the rotor within the stator. The phaser also includes at least one passage for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism comprises a shoulderless locking pin, a well, and first and second channels. The locking pin is disposed in an axial bore in the rotor. The well is formed in one of the rear cover plate and the front cover plate for receiving a portion of the locking pin in locking mode. The first channel is for directing the phase-advance oil to the pin for urging the pin from the well. The first channel also connects the well to a supply of the phase-advance oil. The second channel is for directing the phase-retard oil to the pin for urging the pin from the well. Further, the second channel connects the well to a supply of the phase-retard oil.

None of the references of record teach or suggest a locking pin mechanism including a shoulderless locking pin as recited in claim 16. As best seen in FIG. 1 of the Ushida reference, the piston (7) includes a shoulder portion that is used in conjunction with the fluid pressure supplied through passage (33) to move the piston (7) into the retracted position shown in FIG. 5.

In addition, the Ichinose reference also includes a locking pin having a shoulder and thereby fails to teach all of the limitations included in claim 16. *See Ichinose*, FIGS. 5-7, 10, 12 and 14. Furthermore, there is nothing to suggest that a shoulderless locking pin may be used with the configuration disclosed in the Ichinose reference. In the Ichinose reference, oil is supplied from the advance and retard chambers (121, 123) through the upper channels (233, 235) to supply a lift force on the shoulder portion of the pin (23) to counteract the bias of the spring (237) and move the pin (230) from the fully extended position shown in FIG. 6. Without the shoulder on the pin (230), the oil would not have a surface to supply the lift force necessary to move the pin (230) from its extended position. Specifically, the oil entering the upper channels (233, 235) would not have a surface to impose a lift force since the shoulder would not be present. Further, in the fully extended position, the front face of the pin (230) is engaged with the surface of the well (231) thereby blocking off the path of oil from the passages (237, 239) to the front force of the pin (230). Therefore, the oil entering the well (231) through lower passages (237, 239) would not be able to impose a lift force on the front face of the pin (230) to unlock the pin (230). Thus, eliminating the shoulder on the pin (230) would effectively render the device disclosed in the Ichinose reference inoperable.

Moreover, the Ushia reference does not teach or suggest a second channel that connects the well to a supply of phase-retard oil to urge the shoulderless locking pin from the well as recited in claim 16. Instead, the Ushida reference includes a channel (29, 31, 33) that extends between the phase-retard chambers (10, 11) and a hydraulic chamber (23) positioned adjacent to an upper portion of the piston (7).

*See Ushida*, Col. 10, lines 30-32; Col. 12, lines 15-22; FIGS. 1, 2, 5. The channel (29, 31, 33) does not connect the supply of phase-retard oil to the hydraulic chamber (24). *See Ushida*, Col. 10, lines 32-34. For this additional reason, the Ushida reference fails to teach or suggest all the limitations included in claim 16.

New claim 17 depends from claim 16 and states that the locking pin is straight sided. Further, new claim 18 states that the locking pin has an end surface, wherein the phase-advance oil and the phase-retard oil is directed to the end surface. As with claim 16, none of the references of record teach or suggest the features set forth in claims 17 and 18.

## Conclusion

In light of the foregoing, Applicants submit that claims 1-3, 6 and 9-18 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

The Commissioner is authorized to charge the $88.00 fee for the independent claim in excess of three required under 37 C.F.R. § 1.16(b), and any other fee that may have been overlooked, to Deposit Account No. 10-0223.

Respectfully submitted,

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